

Appl. S.N. 10/723,411
Amdt. Dated June 6, 2007
Reply to Office Action of 04/06/07

140314-1

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REMARKS/ARGUMENTS

This amendment is responsive to the Office Action mailed April 6, 2007, wherein claims 1-14, 16-27, 29-36, 39, 40, 45 and 46 were rejected and 15, 28, 37, 38, 41-44 were objected to. Claims 3, 10-13, 22 and 34-39 were rejected under 35 USC §101 because the claimed invention is directed to non-statutory subject matter. Claims 1-5 and 19-24 were rejected under 35 USC §102(e) as anticipated by Dunne et al. (US 7,024,021); Claims 6-14, 16-18, 25-27, 29-36, 38-40, and 45-46 were rejected under 35 USC §103(a) as being unpatentable over Dunn et al. (US 7,024,021) in view of Celler et al. (US 7,103,204); Claims 15, 28, 37, 38, 41, 42, 43 and 44 were objected to as being dependent upon a rejected base claim, but allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In this amendment, claims 1-5, 19-24, 27-28, 36, 41 and 46 were canceled without prejudice and claims 10-13, 25, 29-30, 34-35, 37-39, 40 and 42 were amended. No new matter has been added.

Claims 6-18, 25-26, 29-36, 40, and 42-25 remain pending in this application. Reconsideration in light of the above amendments and the following remarks is respectfully requested.

Claims 3, 10-13, 22 and 34-39 were rejected under 35 USC 101 for being directed to non-statutory subject matter. Claims 3 and 22 have been canceled; claims 10 and 34 have been amended to recite a computerized method comprising steps for producing a tangible result – a segmented structure. Applicants respectfully submit that claims 10 and 34, as amended, and claims depending thereon now recited statutory subject matter. Withdrawal of the rejection of claims 10-13 and 34-39 under 35 USC 101 is respectfully requested.

Claims 1-5 and 19-24 have been rejected under 35 USC 102(e) over Dunn et al., however claims 1-5 and 19-24 have been canceled without prejudice and therefore the rejection has been obviated.

Claims 6-14, 16-18, 25-27, 29-36, 38-40, and 45-46 were rejected under 35 USC §103(a) as being unpatentable over Dunn et al. (US 7,024,021, hereinafter "Dunne") in view of Celler et al. (US 7,103,204, hereinafter Celler). . Claims 27, 36 and 46 have been canceled, however claims 27 and 36 have been incorporated into claims 25 and 34, respectively, so the following remarks will apply accordingly. Applicants respectfully traverse the rejection of claims 6-14, 16-18, 25-26, 29-35, 38-40, and 45 under 35 USC 103(a) over Dunne in view of Celler. Claim 40 has been amended to incorporate the allowable subject matter of claim 41 and therefore is no longer subject to the rejection under 35 USC 103, claim 45 depends from claim 40 and therefore is

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similarly allowable. Applicants respectfully request withdrawal of the rejection of claims 40 and 45 under 35 USC 103.

Independent claims 6, 10, 14, 25 (as amended) and 34 (as amended) each recite "iteratively merging one or more candidate voxels into a foreground region comprising at least one or more seed voxels, wherein the candidate voxels are merged based on one or more dynamic constraints and wherein the merged candidate voxels become the seed voxels for the next iteration". Applicants respectfully submit that neither of the Dunne and Celler references teach individually or in combination Applicants' recited step of merging the candidate voxels into a foreground region based on one or more dynamic constraints and moreover neither reference teaches or discloses the recited merged candidate voxels becoming seed voxels for the next iteration.

For a *prima facie* case of obviousness, the Examiner must set forth the differences in the claim over the applied references, set forth the proposed modifications of the references, which would be necessary to arrive at the claimed subject matter, and explain why the proposed modification would be obvious. The Applicants interpret from the Office Action that the proposed modification would be to combine Dunne's method of identifying a structure of interest with the dynamic solution routine of Celler. The Examiner stated that Dunne does not show or explicitly state Applicants' recited "dynamic constraints and wherein the merged candidate voxels become the seed voxels for the next iteration". However, the Examiner in making the rejection under 35 UC 103 only proposed Celler for the dynamic routine and provided no proposed modification or combination to obtain Applicants' recited merged candidate voxels becoming the seed voxels for the next iteration. Applicants respectfully submit the Examiner has failed to establish a *prima facie* case of obviousness for at least the following reasons: 1) The Examiner has not considered all claim limitations in making the rejection under 35 USC 103(a); 2) The Examiner has failed to set forth the proposed modifications of the Dunne and Celler references to arrive at the claimed subject matter. Further, Applicants respectfully submit that, even if a *prima facie* case of obviousness was established, no reasonable combination of the Dunne and Celler references would obtain Applicants' recited invention.

The Examiner has not considered all claim limitation in making the rejection under 35 USC 103(a). Specifically, the Examiner has not established that either of the Dunne and Celler references show or disclose Applicants' recited step in which merged candidate voxels (into a foreground region) become seed voxels for the next iteration of a segmenting process. Applicants have carefully reviewed the Dunne and Celler references, including the passages cited

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by the Examiner, and submit that neither the Dunne or Celler references teach, disclose or suggest such a step. By contrast, Dunne actually teaches away from a merged voxel structure. Specifically, Dunne teaches a subroutine Grow, at for example col. 9, line 20- col. 10 line 3, in which a user selects an initial x,y,z point (akin to Applicants' seed voxel) and attempts to grow a volume in all directions by recursion, where recursion involves having the grow function repeatedly call itself until all avenues of expansion are blocked by some voxel acceptance criteria. The recursive technique taught by Dunne is a voxel by voxel analysis, which is computationally intensive. Applicants' recited method of using merged candidate voxels as seed voxel for further iterations is particularly computationally effective for growing regions of a segmented structure and once the growing is terminated, the merged voxels comprise the segmented structure. Nowhere does the Dunne reference teach Applicants' claimed merged voxel approach. The Celler reference does not overcome the deficiencies of the Dunne reference. The Celler reference merely teaches a technique for produce different values for voxels contained within a three dimensional volume of an object. Specifically, the dynamic solution routine of Celler calculates a set of values corresponding to various measurable properties at a plurality of locations of the object, e.g. radioactivity. Nowhere does the Celler reference teach, suggest or disclose any region growing techniques and therefore fails to overcome the deficiency of Dunne. Further, the Examiner has not provided any reasonable basis for combining these two references since there is no teaching in either reference for all of the elements of Applicants' claimed invention. Therefore, Applicants respectfully submit that for the reasons set forth above, claims 6, 10, 14, 25 and 34 are patentable over Dunne and Celler, taken alone or in combination. Claims 7-14, 16-18, 26-27, 29-36 and 38-40 depend directly or indirectly therefrom and are patentable for similar reasons.

Therefore, Applicants' respectfully submit that claims 6-14, 16-18, 25-27, 29-36 and 38-40, are allowable and requests that the rejections under 35 USC §103 (a) be withdrawn.

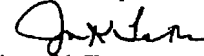
In view of the foregoing amendment and for the reasons set out above, Applicants respectfully submit that the application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are respectfully requested.

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Should the Examiner believe that anything further is needed to place the application in condition for allowance, the Examiner is requested to contact Applicants' undersigned representative at the telephone number below.

Respectfully submitted,



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